

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

A31.3
B72R

AD-33 Bookplate
(1-63)

NATIONAL

**A
G
R
I
C
U
L
T
U
R
A
L**



LIBRARYA31.3

76671

B72R

U. S. DEPT. OF AGRICULTURE
NATIONAL EXPERIMENTAL LIBRARY

DEC 18 1964

C & R-PREP.

THE ROLE OF USDA IN RESEARCH AND EDUCATION

By DR. NYLE C. BRADY,
Director of Science and
Education,
U.S. Department
of Agriculture,
Washington, D.C.

Talk by Dr. Nyle C. Brady
Director of Science and Education
U. S. Department of Agriculture
Washington, D. C.
1964

THE ROLE OF USDA IN RESEARCH AND EDUCATION

I welcome the opportunity of being here today as it gives me a chance to talk with you about a part of agriculture that is vitally important to the welfare of every American citizen.

I am referring to the research and education activities of the Department of Agriculture.

Most of you represent highly progressive industrial and private institutions and fully appreciate the great importance of research and education in creating and promoting agricultural technology. In fact, you have contributed a great deal to make that technology possible--to help us meet the needs of twice as many people with about half as many farm workers as we had a half century ago.

I suspect, however, that most Americans are not aware of the remarkable role that research and education have played in bringing them the benefits of the scientific revolution. Like the air they breathe and the water they drink, these benefits are simply taken for granted.

Because of the progress made through research, we in the United States have the most abundant, the most varied and nutritious supply of food anywhere in the world. Our food costs have been held down to a modest amount--19 percent of our yearly incomes.

Soil erosion has been decreased and we are taking steps to enrich our land for future generations of Americans. Our water supplies are being conserved and utilized more efficiently so those who follow us will have enough. Ingenious methods of controlling insects have opened up promising possibilities for more effective control of home, farm, and garden pests. Plants that produce our major foods and fibers have been adapted to nearly every part of the country. Machinery has been designed to take the burden out of most farm jobs.

Our technology has been improved to such an extent that we no longer need large numbers of men to run our farms. Consequently, manpower has been released for the other important jobs in our economy that are necessary to make a nation grow and achieve a high level of living.

Research-based progress has meant new jobs in industries closely related to farming, as well as in the businesses that sell farmers the things they need for family living and to produce crops and livestock. These jobs add to the total strength of our economy and make life a little better and easier for all of us.

I am sure you will agree that we owe much of what we have in the United States to the research efforts of our Federal-State structure. Working together at all levels, research and extension have added immeasurably to the development of this Nation's natural and human resources. We see the results not only in the achievements of agriculture, but also in the influence of science and education as the basis for progress in our society.

I am convinced, however, that we cannot be satisfied to face the future with things as they are today. We cannot stay the onward rush of change. Let us, instead, spend our energy in guiding this force to better serve the needs of our Nation.

We in the Department of Agriculture are determined to do all we can to strengthen the cooperative structure for research and extension for the job ahead. . .and we have already taken several steps in this direction.

I would now like to show you some charts that illustrate this improved nationwide structure and how it operates for the good of agriculture and the Nation. Effective as it is, keep in mind that we are continuously probing for ways to improve it still further.

SCIENCE and EDUCATION in USDA

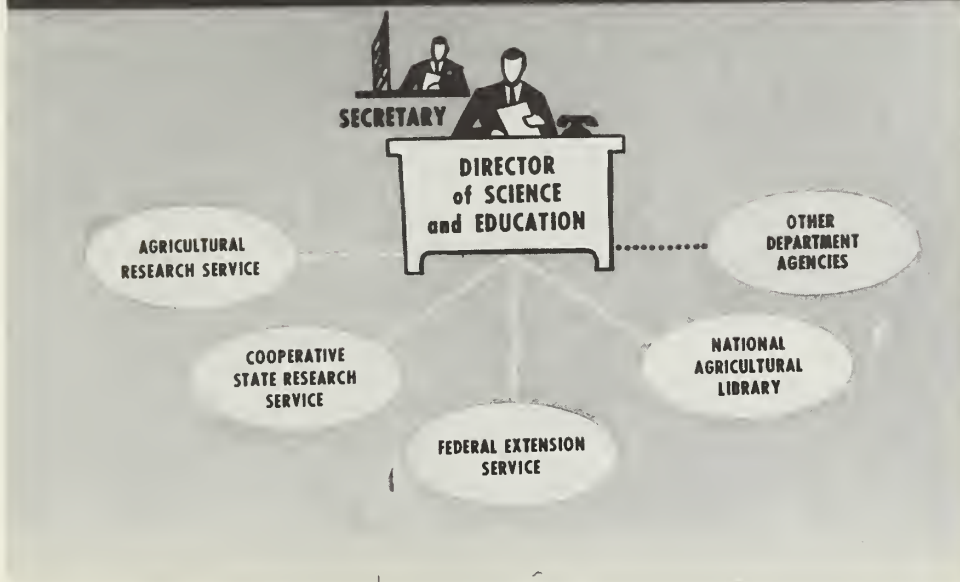


CHART 1

The Director of Science and Education heads this new grouping of agencies: the Agricultural Research Service, the principal research agency of the Department; the Cooperative State Research Service, which administers Federal-Grant funds to State experiment stations; the Federal Extension Service, which exerts national leadership in extension work; and the Library, which is so important to the successful operation of the other three.

The Director also coordinates science and education activities carried on in other Department agencies, such as the Forest Service and the Agricultural Marketing Service.

This marks the first time that responsibility for science and education has been assigned to a member of the Secretary's staff without also burdening him with responsibilities for the overall operation of several other Department agencies. The Director is in a position to focus his full attention on science and education.

USDA and OTHER FEDERAL ORGANIZATIONS

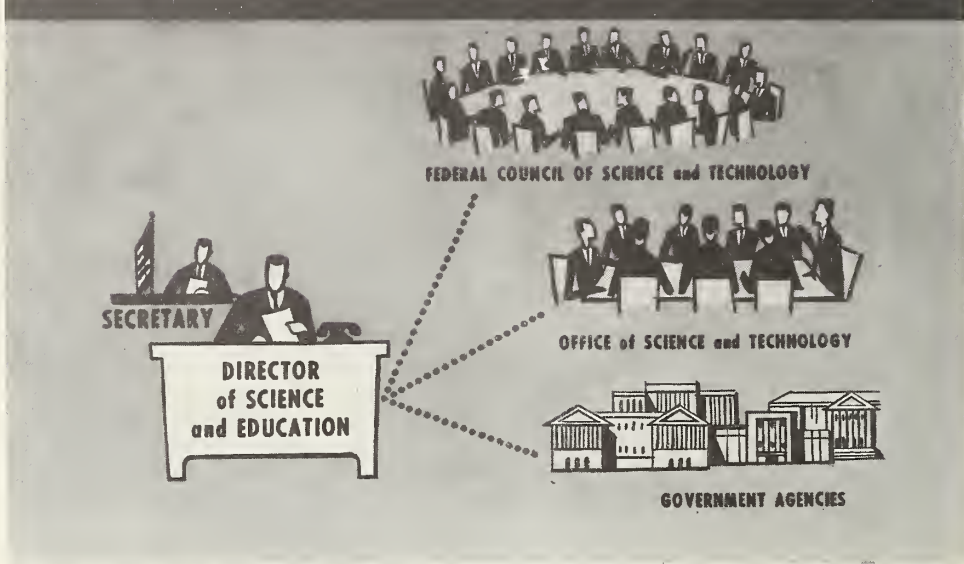


CHART 2

Maintaining liaison with other Federal organizations engaged in scientific work is another important concern of the Director of Science and Education. He represents USDA on the Federal Council of Science and Technology, a body concerned with improving the planning and management of Government research.

The Office of Science and Technology has major responsibility for coordinating research among Federal agencies. The President's Advisor heads these two groups.

USDA cooperates in research with many Federal agencies. To cite just two examples in one area, we worked with the Department of Defense to develop flameproof military clothing and the blood plasma extender known as dextran.

In addition, USDA participates in the Science Information Exchange, which provides first-hand knowledge of all Federal research projects in each field. The Department also is represented on inter-departmental committees dealing with subjects in which we have an active interest.

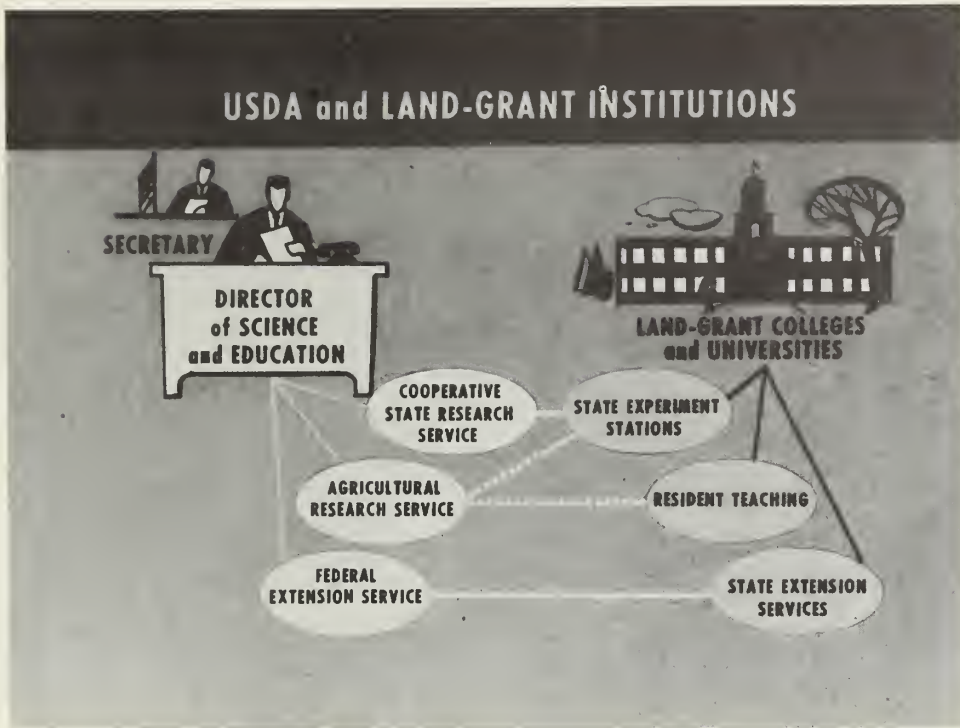


CHART 3

Maintaining close relations with the Nation's Land-Grant colleges and universities is the other major concern of the Director of Science and Education.

This is the oldest link that USDA has, dating back for more than a century. It is one of our most satisfying and best-established relationships, and the degree of cooperation and coordination is substantial, as you can see.

It's common knowledge that the Land-Grant schools turn out large numbers of men and women well trained in the sciences. But it is not generally known that USDA also contributes toward supplying scientific manpower.

This is done through providing fellowships and traineeships at various levels of study, employment of graduate assistants for research, sponsorship of scientific courses, and general encouragement for those wishing leave to study.

With this broad view of USDA's role in research and education as a background, let's take a look at the research side of the picture.

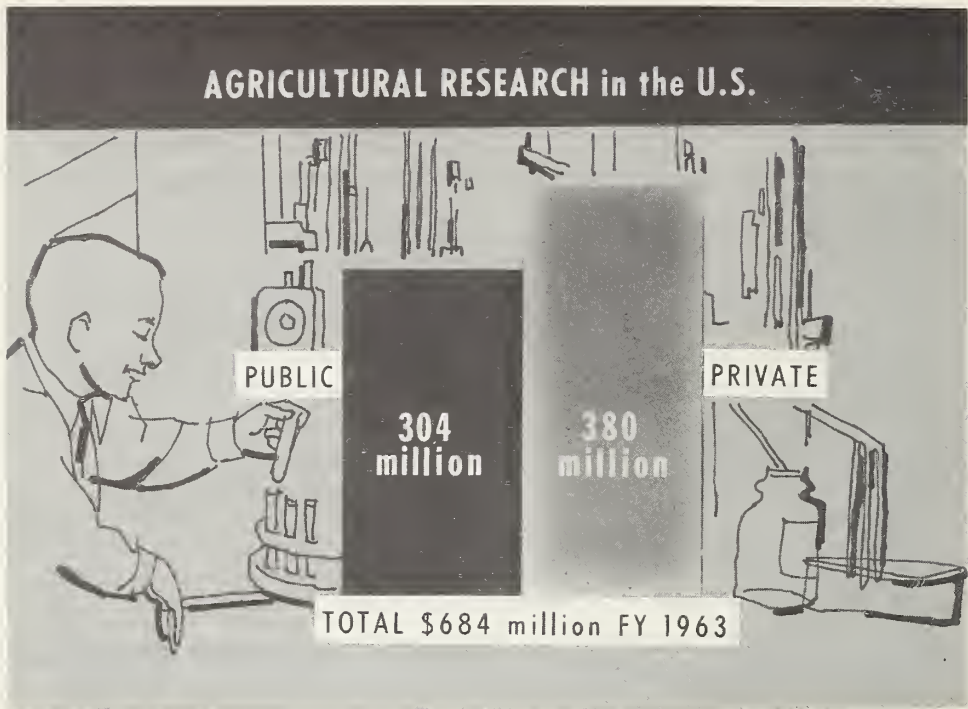


CHART 4

Agricultural research in the United States is a joint effort of public and private agencies.

The public partners--that is, USDA and the State experiment stations--spend about \$304 million a year.

Our best estimate of what private industry spends is roughly \$380 million. Industry has become a major force in agricultural research in the last few decades--because of the machinery, chemicals, and biologicals that industry supplies to agriculture, and because of the raw materials that agriculture provides to industry.

Total funds for agricultural research in this country amounted to approximately \$684 million in Fiscal Year 1963.

PUBLIC FUNDS for AGRICULTURAL RESEARCH



CHART 5

Now let's examine the public funds for agricultural research a little more closely.

The States provide \$136 million a year.

The Federal Government provides \$130 million for USDA and \$38 million for Federal grants to the States.

FEDERAL FUNDS for AGRICULTURAL RESEARCH

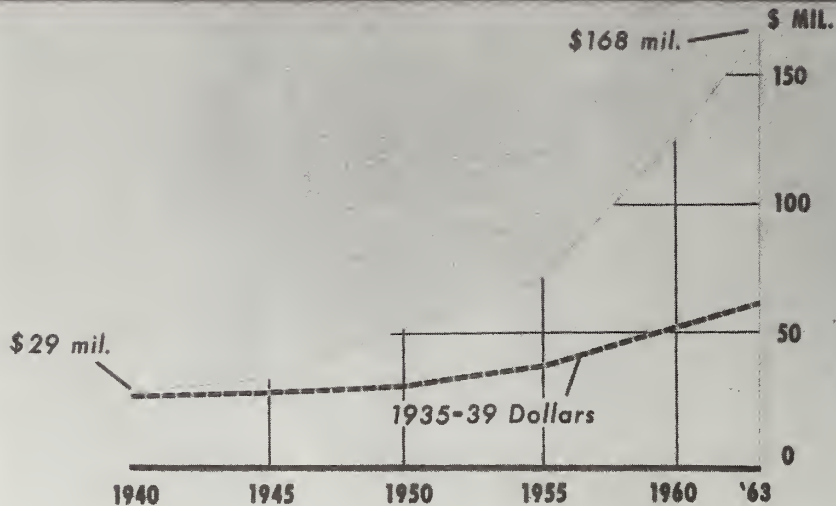


CHART 6

Federal funds for agricultural research climbed from \$29 million in 1940 to \$168 million in 1963.

But don't overlook this significant point: as you can see from the broken line, which represents 1935-39 dollars, these funds buy only a little more than twice as much research as we had in 1940.

Furthermore, although Federal support for research in agriculture has grown since World War II, it hasn't grown nearly so fast as Federal support for research in other areas. Let me illustrate.

AGRICULTURE'S SHARE of FEDERAL FUNDS for RESEARCH

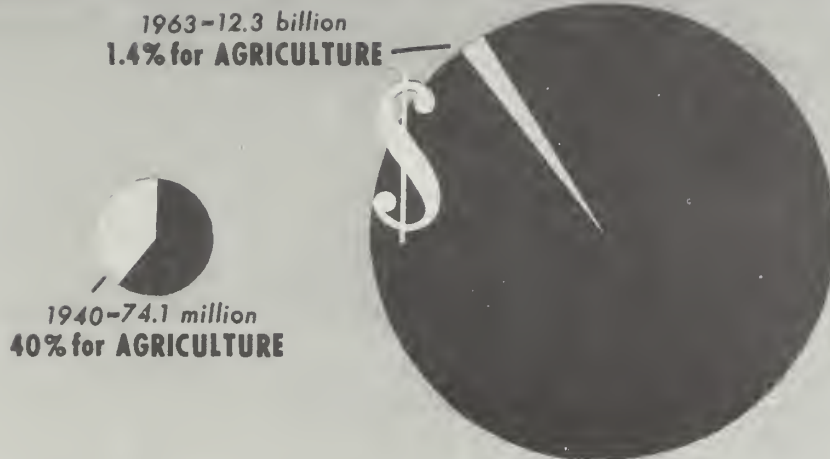


CHART 7

Agriculture's share of all Federal funds for research amounted to 40 percent in 1940. But today, agriculture receives less than 1 1/2 percent of the funds spent on research by the Federal Government.

As we have already seen, agriculture's share supports research both in the State experiment stations and in USDA.

CHART 8

In the research conducted by USDA, six different agencies are involved. You will note that the Agricultural Research Service accounts for a little more than two-thirds of the Department's total effort. Each of the other agencies has one or more divisions engaged in research aimed at helping the agency carry out its mission.

CHART 9

In coordinating research in USDA, the Director of Science and Education is assisted by the Administrator of the Agricultural Research Service and also has the help of some well-established committees.

To begin with, several advisory committees aid in program development.

The legally required National Agricultural Research Advisory Committee makes recommendations on policy in the interests of maintaining a dynamic research program.

This committee maintains contact with 11 functional and commodity research advisory committees, which review current research and recommend adjustments. These groups recently replaced 23 older committees, to provide for more effective communication with the many organizations interested in agricultural research.

Secretary Freeman established the Committee on Agricultural Science in 1962. This body, which is composed of 15 of the Nation's outstanding scientists, conducts a continuing evaluation of the research supported by Federal funds, particularly work of a basic nature.

Along with these committees, the Department has an Agricultural Research Council, made up of representatives of Department agencies involved in research. And we have a Central Project Office, which serves as a control center in the review and approval of all research proposals.

Now let's look for a moment at USDA's role in the State research effort.

CHART 8



CHART 9

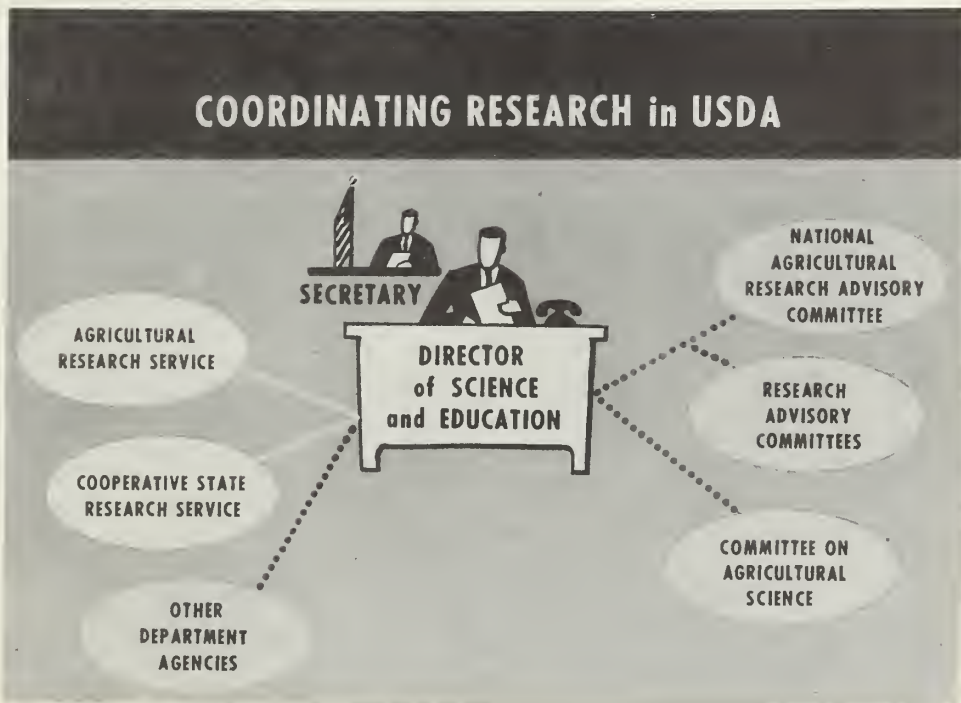


CHART 10

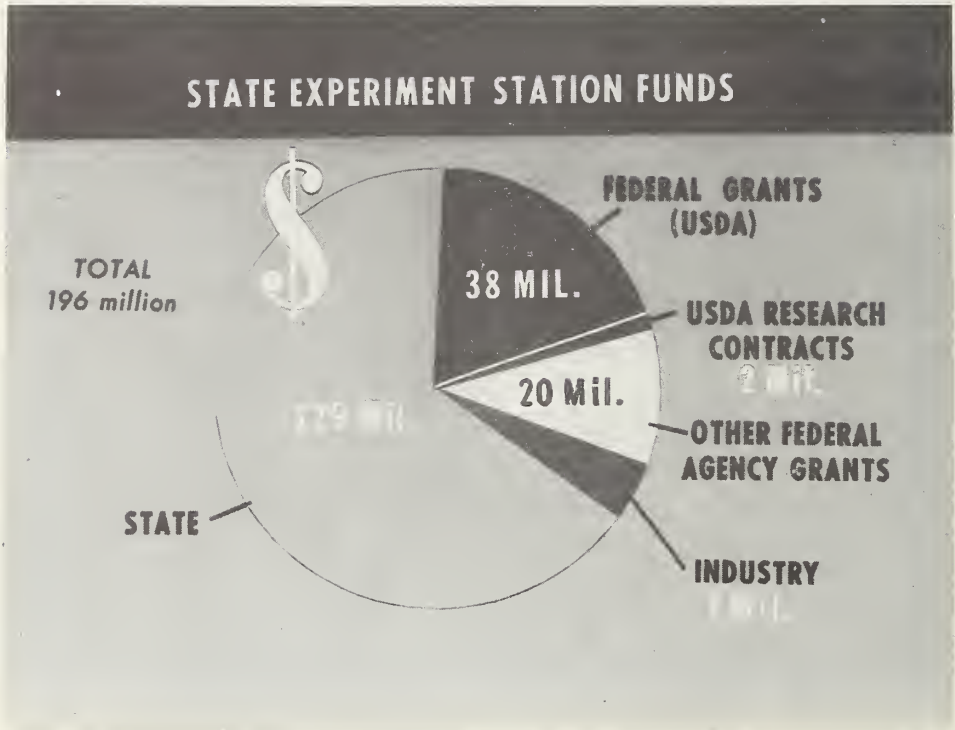


CHART 11

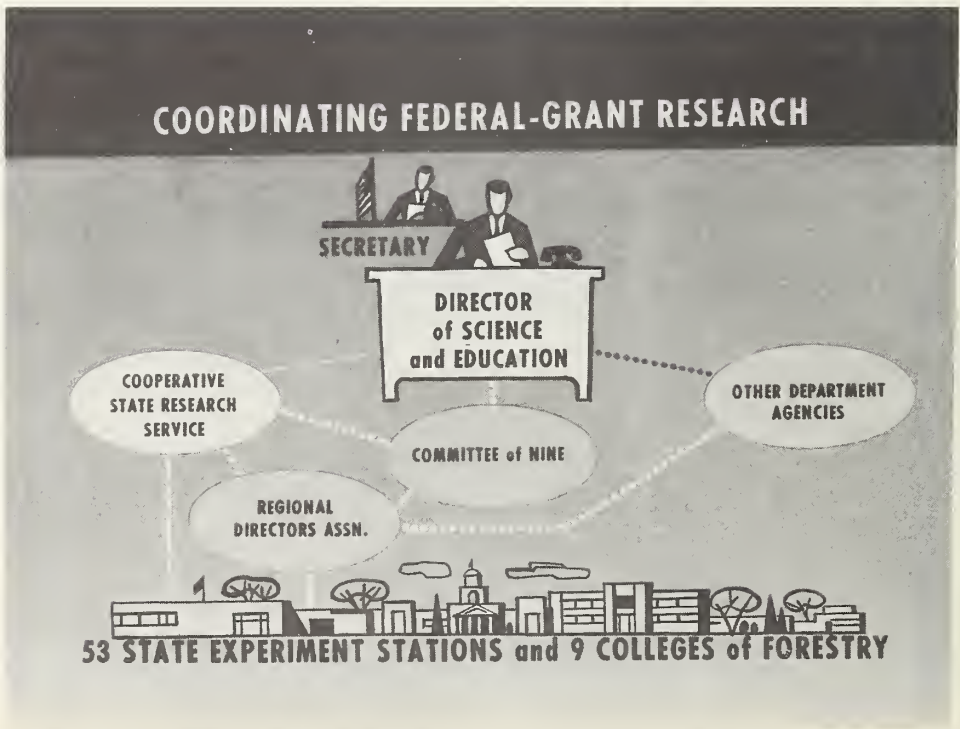


CHART 10

State experiment station funds come from several sources, including State appropriations, industry, and Federal grants. One of the oldest and steadiest is the Federal grants administered by USDA. These, together with the Department research contracts, amount to more than a fifth of the funds available to the stations.

CHART 11

Coordinating Federal-grant work is the job of the Cooperative State Research Service. This is primarily a matter of service--to see that the funds are spent as Congress intended and to give requested technical assistance such as conducting comprehensive reviews of research and participating in the planning of regional studies.

Up-to-date information on all State projects--both Federally and State supported--is maintained by the Cooperative State Research Service. This information is furnished to the stations themselves as well as to the Science Information Exchange and the research advisory committees I mentioned earlier.

Several groups make important contributions to the coordination of the Federal-State effort in agricultural research.

The Committee of Nine, which you see here, is chosen by the Directors of the State stations to recommend research to be supported by the 25 percent of funds set aside under the Hatch Act for regional research. This encourages joint planning and conduct of work on problems of broad regional significance.

In addition, the Experiment Station Committee on Organization and Policy helps keep USDA informed on the programs in the States and their plans for additional work.

Last year, Secretary Freeman established an ad hoc committee to review and evaluate the research facility needs of the States, the Department, and various regions. Clear identification of such needs will be useful in planning for more effective research at all levels.

I also want to point out that the Cooperative State Research Service was established as a separate agency by Secretary Freeman in 1961 to improve the mechanism for mutual planning and coordination of research under our dual, nationwide system. This action placed the research of the State stations on a basis equal to research programs of the Department.

So far, I've talked mainly about the financing of the Nation's agricultural research effort, and how it's organized. Now I want to take a moment to discuss work we are doing.

CHART 12

Let's look first at the research of the Department:

Human Nutrition and Consumer Use research studies the needs of people for food, clothing, and shelter, and how agricultural products can best meet these needs.

The work on Resource Conservation seeks the knowledge needed to make wise use of the Nation's soil, water, forest, and air resources.

Resource Protection is concerned with safeguarding our crops, livestock, and forests against such natural enemies as fire, insects, diseases, parasites, weeds, and nematodes.

Improved Quality and Efficiency are approached in many ways. They include the scientific improvement of crops and livestock through better breeding, feeding, cultural practices, management, fertilizer technology, equipment, and land use.

You can see that about one-fourth of USDA's effort is devoted to Utilization research. Our goals here are to help farm products hold their own against the new synthetics, to find new industrial uses for plentiful commodities, and to develop attractive new food products. As part of this work, we are also trying to gain a better understanding of the physical and chemical properties of farm products and to develop improved methods of processing.

The marketing research is aimed at developing more efficient ways to handle, store, transport, and distribute products; preventing heavy losses from insects, diseases, and other hazards; and finding better ways to measure the quality of products in various marketing channels. Work of this kind is just as important as research on more efficient production, since about 60 percent of the price the consumer pays is for services performed after the crop is produced.

CHART 13

Here's the same breakdown on State research.

Two points stand out there:

First, a large proportion of the total effort is devoted to research on Improved Quality and Efficiency.

Second, the States are doing little work on Utilization.

CHART 12

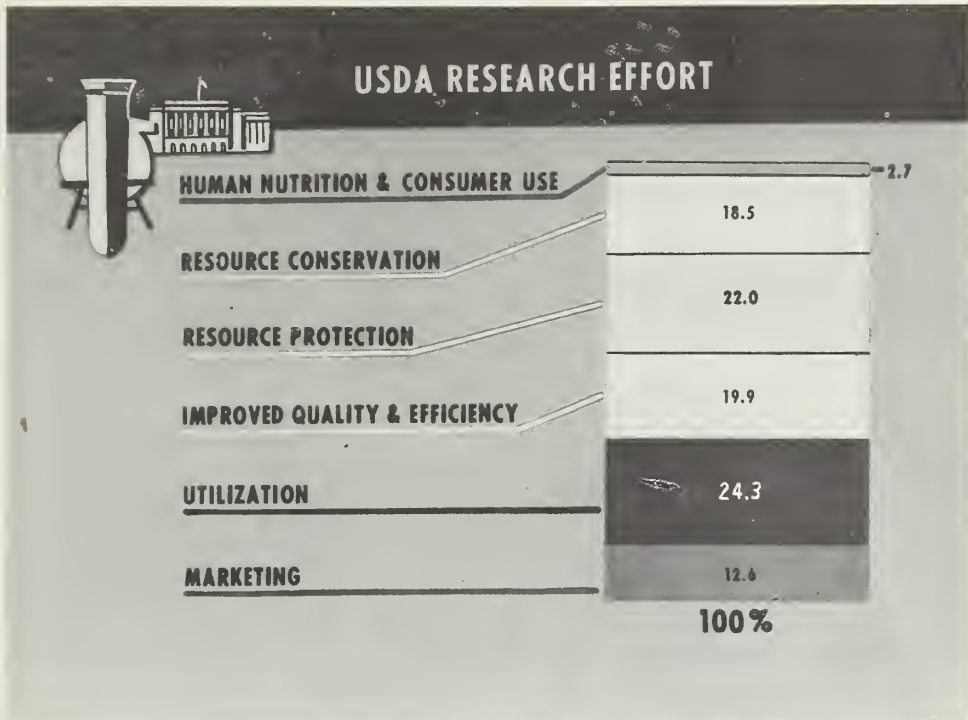


CHART 13

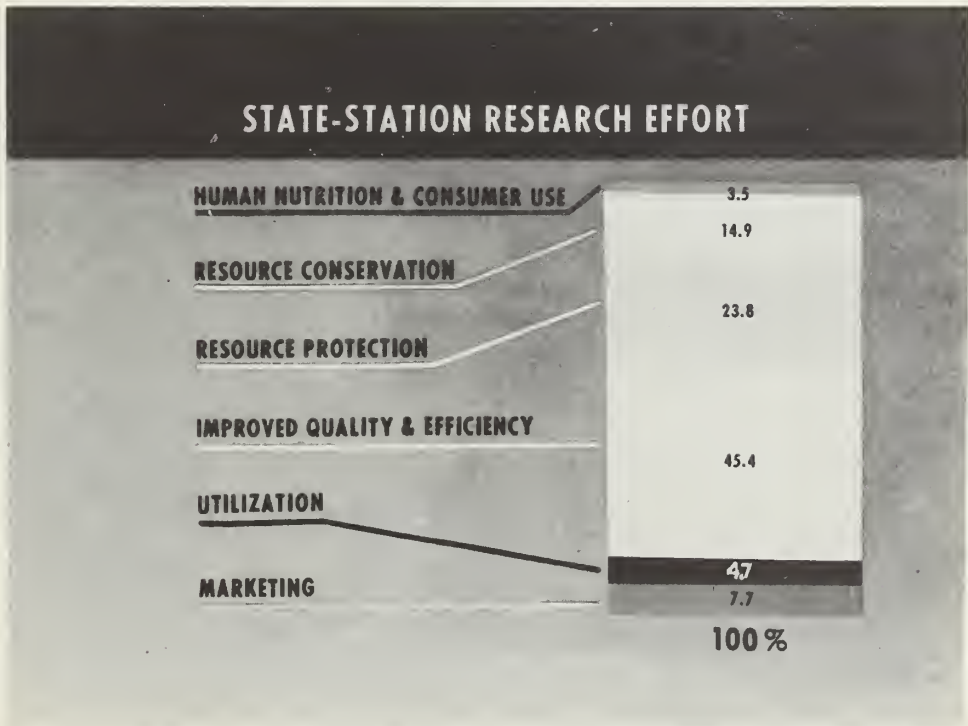


CHART 14

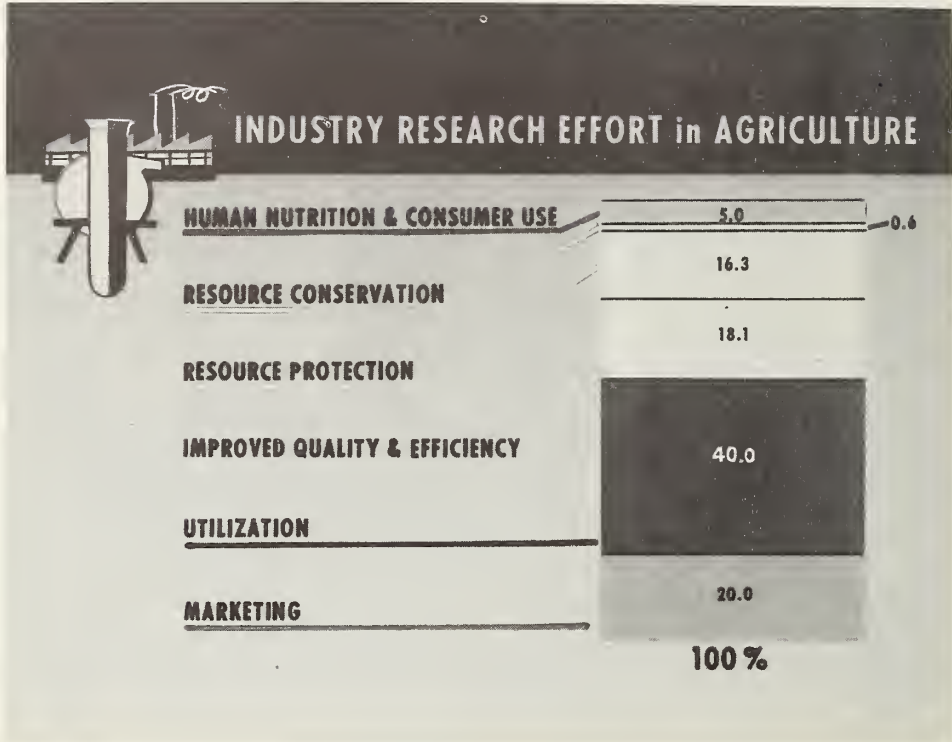


CHART 15

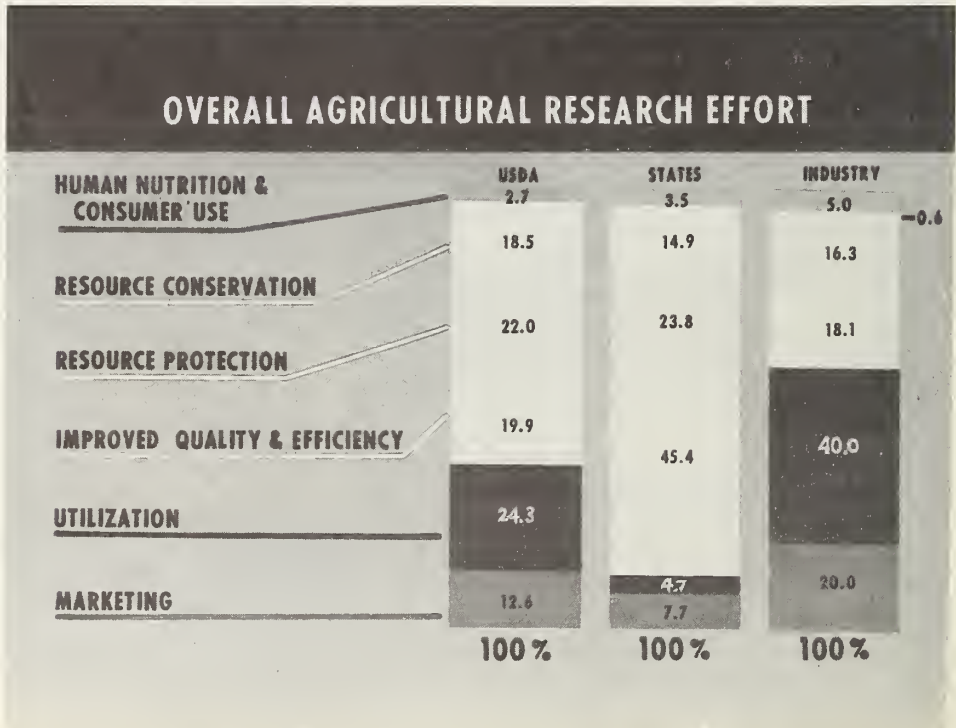


CHART 14

When we look at industry's agricultural research, we immediately notice that Utilization of agricultural products receives strong emphasis. Even so, this effort is small in comparison with the industrial research devoted to competitive raw products such as petroleum.

The work in Resource Conservation, Resource Protection, and Improved Quality and Efficiency is concerned mainly with development of improved products for the farm market--chemicals, pharmaceuticals, fertilizers, farm machinery and structures, feeds, and genetic material.

Similarly, industry's Human Nutrition and Consumer Use research includes considerable work on new and improved household equipment, but little on consumer values in food and other agricultural products.

The sizable investment in Marketing research is mostly concerned with such matters as improving a firm's efficiency, developing a new product, or measuring consumer acceptance of a brand-name item. There is little of the sort of marketing research done by the Department and the State stations.

CHART 15

Here's the overall picture:

In general, industry concentrates on investigations that give promise of yielding commercial products that will make a profit--consumer items made from farm commodities, and production tools for farmers.

But often there is no apparent potential of this kind--perhaps because of uncertainty over whether a profitable product will come out of the work. . .or because industry has already spent money on developing a competitive raw material. . .or because the small number of agricultural producers seems to offer a limited market for a product.

In such cases, public agricultural research--the Department and the States--must do the job. This protects the welfare of all producers, handlers, and consumers. And it often points the way to a new technique or a better approach.

Then, too, most of the basic research in agriculture is done by the public partnership. Although no one can ever predict the outcome

of such explorations, we know from experience that they are the source of the great scientific developments that help agriculture move ahead.

We see this happening right now in the Department's Utilization research effort, which has put considerable emphasis on basic work. Fundamental knowledge developed in our Utilization laboratories--on wash-wear cotton, for example--provides a basis for applied research and development by industrial laboratories. This results in new markets for farmers and new and improved products for consumers.

Let's complete this review of USDA's role in research and education by taking a look at the financing and coordination of cooperative extension work in the United States.

CHART 16

Of the public funds for agricultural extension, the States and counties provide \$105 million a year.

The Federal Government provides a total of \$75 million, including \$3 million to operate the small Washington headquarters that furnishes national leadership for this work. The \$1 million from other Federal agencies supports extension efforts in such fields as civil defense, training of foreign students, work with Indians, and Rural Areas Development.

In all, extension funds for fiscal year 1963 amounted to \$181 million--most of which was spent by the States.

CHART 17

State extension funds amounted to over \$168 million.

You can see that payments to States, administered by the Federal Extension Service, make up well over a third of the available funds.

CHART 16

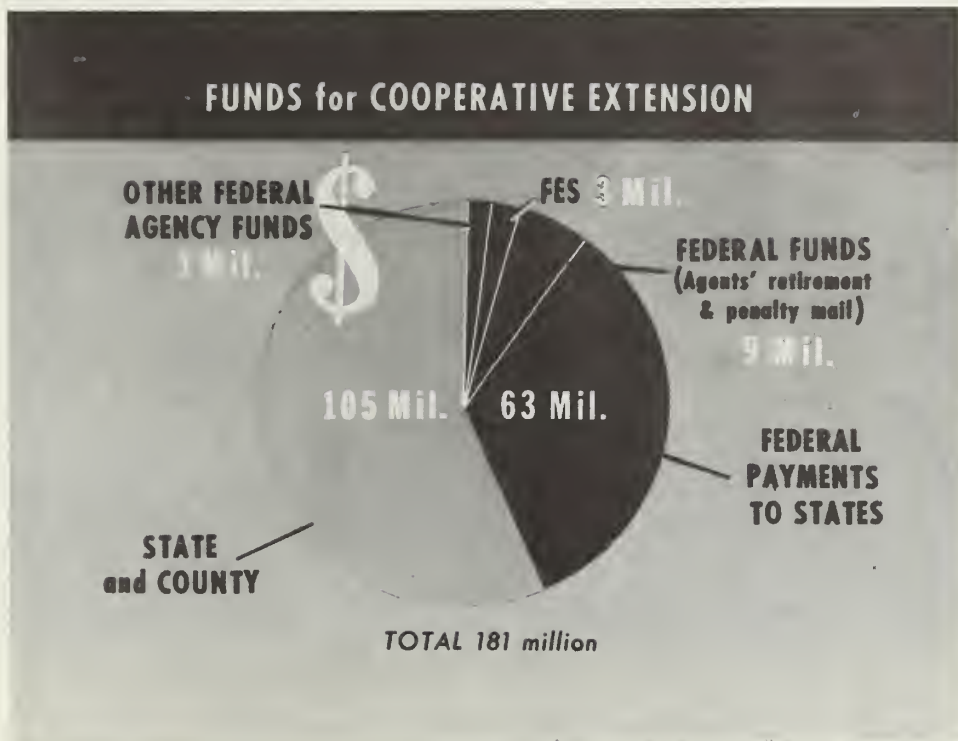
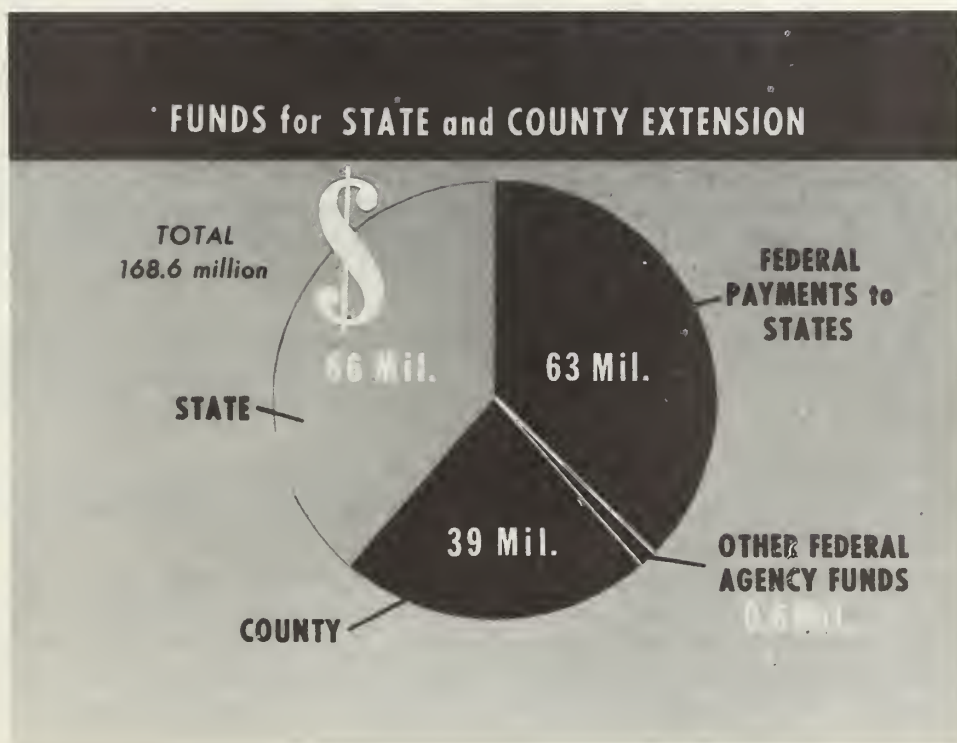


CHART 17



COORDINATING EDUCATION in USDA

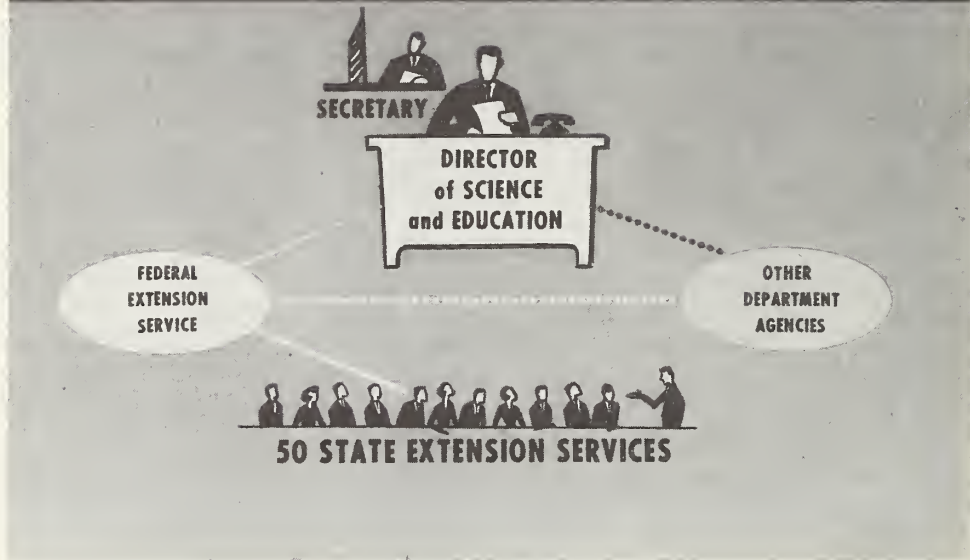


CHART 18

The educational activities of the Department are coordinated through the Federal Extension Service and involve little of the formal and complex machinery needed to conduct the research effort.

Extension has long had a good relationship with other Department agencies, particularly those engaged in research. But we are looking for ways to improve coordination in this area. I'll have more to say about that in a moment.

In broad outline, then, these are the ways that our nationwide research and extension activities are carried out. We know the structure is effective. Yet, there may be ways to further improve the way we coordinate our public agricultural research.

We could, for example, do a better job of defining our responsibilities--what work should be done by the States, what work should be done by USDA, and what work should be carried on cooperatively by both.

The decision is simple when you are dealing with a foreign animal disease that calls for a laboratory like the Federal installation at Plum Island off the coast of New York. The answer is equally obvious when a State faces a strictly local or State-wide problem.

In between is a large gray area where the answers are not so simple. Most utilization research, for example, has so far been carried out by the Federal Government. I see no reason why the States cannot assume more of this work than they have in the past.

Another possibility for improved coordination lies in doing a better job of joint planning to insure that the Federal and State research programs are more directly pointed toward a single national purpose.

Working together, the States and the Department could set themselves several important long-range research objectives, such as reducing the cost of producing beef cattle. We could then divide up the many difficult problems involved and get on with the job.

The entire Nation would gain from the inevitable increase in meat consumption, in use of grain, and better balanced agricultural production.

We could set ourselves a number of joint priorities for the next few years. Similar planning could be useful in initiating entirely new research projects and in locating new facilities.

An approach of this kind might well result in more effective direction of our total research effort. It is the best way I know to get full return for your research money.

In extension, too, there may be opportunities to improve coordination--to bring extension and research closer together at all levels.

Here again, we need to define their responsibilities a little more clearly. I believe that extension can take over many of the functions that are ordinarily done by research, such as testing new varieties and conducting fertilizer trials. These functions are not really so much research as they are demonstrations of the value of

new findings. And extension workers are in a particularly good position to adapt such demonstrations to local conditions.

This will mean an increased need for more research-trained people in extension, something that has been apparent for some time. Extension today is searching for people who have the same kind of training, background, and education that our research scientists have. The growing complexity of agriculture and the kind of information that research develops makes this a practical necessity.

I believe we may be able to strengthen relationships in our own Department--between the Federal Extension Service and the agencies that deal directly with farmers. Extension workers need to be well informed about the activities of the Soil Conservation Service, Farmers Home Administration, and the Forest Service.

Finally, I believe that the Federal Extension Service and the research agencies of the Department will be getting together frequently in the future to explore ways of improving coordination, in the interests of helping the Nation's farmers.

Science and education have a truly staggering job to perform in the years ahead--to make the world's most efficient agriculture still more efficient and to make all areas of agriculture full beneficiaries of research and technology.

There's no question that we will do it. The U.S. Department of Agriculture is moving ahead with renewed emphasis on research and extension and the only question is one of time.

